1. A method for communicating between a plurality of nodes of a communication system in which a series of fixed-length frames pass between the nodes of the system comprising:

provisioning the communication system, including allocating in each frame a fixed part, said fixed part including a first part of the frame for passing control information between the nodes and a second part for passing data streams over a plurality of dynamically allocated channels between the nodes;

at a first node in the system, (1) receiving a communication request for a dynamically allocated channel between a second node and a third node including receiving request data from the second node in the first part of a received frame, (2) allocating a portion of the second part of the frames to said dynamically allocated channel, and (3) broadcasting a response to the request including transmitting control data in the first part of a frame; and

at the second node, (1) receiving the control data transmitted by the first node, (2) determining the portion of the second part of each of the frames that is allocated to said dynamically allocated channel, (2) sending a data stream over said dynamically allocated channel to the third node, including passing data in said portion of the second part of each of a series of frames.

2. The method of claim 1 wherein receiving the request for the dynamically allocated channel between the second node and the third node includes receiving a request to assign a communication session for passing a data stream between the second node and the third node.

3. The method of claim 1 wherein receiving the request to assign the communication session includes receiving a priority for said communication session.

4. The method of claim 1 wherein receiving the request for the dynamically allocated channel between the second node and the third node includes receiving a request to change an allocated capacity of a communication channel previously allocated to communication between the second node and the third node.

5. The method of claim 1 wherein allocating the portion of the second part of the frames to said communication channel includes modifying allocated capacities of multiple communication channels.

6. The method of claim 1 wherein the fixed part includes a third part that is allocate for fixed-rate channels between the nodes.

7. The method of claim 1 wherein the communication system includes a SONET network and each frame includes a Synchronous Payload Envelope (SPE), and wherein allocating the fixed part of each frame includes allocating a portion of the SPE of each frame.

8. The method of claim 1 wherein the portion of the SPE is the entire SPE.

9. The method of claim 1 wherein the portion of the SPE includes a virtual tributary group.

10. The method of claim 1 wherein provisioning the communication system further includes allocating a portion of the SPE to conventional SONET virtual tributaries, whereby a portion of the communication capacity of the SONET network is used for conventional communication on statically allocated virtual paths.

11. The method of claim 1 wherein the portion of the SPE includes a virtual tributary.

12. The method of claim 1 wherein the first part of the frame and the second part of the frame are each integral numbers of columns of the SPE.

13. The method of claim 1 wherein allocating a portion of the second part of the frames includes allocating an integral number of nine-byte columns of the SPE.

14. A method for passing data between nodes of a SONET network comprising:

provisioning the SONET network, including identifying a fixed portion of synchronous frames transmitted over the SONET network for passing the data between the nodes, said fixed portion including a first part of the frame for passing control information between the nodes and a second part for passing data streams over dynamically allocated channels between the nodes;

establishing a plurality of communication channels for passing data between the nodes and associating each communication channel with a plurality of terminal nodes, wherein the plurality of communication channels includes a first communication channel coupling a second node to a third node;

at a first node, determining an allocation of a portion of the second part of the frames for each of the communication channels;

broadcasting the allocation from the first node to the other nodes including passing information in the first part of one or more frames;

at each of the second and the third nodes, receiving control information in the first part of a sequence of frames and processing the received control information to determine the portion of a frame that is allocated to the first communication channel;

at the second node, receiving a first frame from the network, adding data for transmission to the third node into the portion of the first frame that is allocated to the

first communication channel; and transmitting the first frame onto the network; and

at the third node, receiving the first frame from the network, and extracting the data from the portion of the first frame that is allocated to the first communication channel.

15. The method of claim 14 further comprising:

sending a request from the second node to the first node to change the allocated capacity of the first communication channel; and

at the first node, receiving the request, determining an update to the allocation of the second part of the frames for the communication channels, and broadcasting control information to the other nodes encoding the update to the allocation.

16. A communication system comprising a plurality of nodes coupled by a communication path, wherein one of the nodes is an arbiter node, and wherein each node includes:

a framer for receiving a series of communication frames from the communication path, and for transmitting the communication frames along the communication path;

circuitry for identifying control information in each of the communication frames;

circuitry for determining an allocated location and a size of a portion of each communication frame that is allocated to a selected one of the traffic streams using the identified control information; and

circuitry for inserting data for the selected traffic stream into the communication frame at the determined location for the selected stream.

17. The communication system of claim 16 further comprising:

circuitry for inserting a request to change the allocated size for the traffic stream in the communication frame prior to its transmission.

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